CBCS SCHEME

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15AU64

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Automotive Transmission

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain the construction and working of single plate clutch. **(10 Marks)**

b. What are the functions and requirements of clutch? **(06 Marks)**

OR

2 a. List some of the common clutch troubles and the causes for it. **(06 Marks)**

b. Mention some of the clutch friction lining materials and list the various desirable properties. **(10 Marks)**

Module-2

3 a. List the types of torque converters and explain any one with relevant figures. **(10 Marks)**

b. What are the advantages and disadvantages of fluid coupling? **(06 Marks)**

OR

4 a. Discuss the performance characteristics of torque converters with the help of graphs. **(10 Marks)**

b. Differentiate between torque converter and fluid coupling. **(06 Marks)**

Module-3

5 a. With neat sketch explain the working of constant mesh gearbox. **(06 Marks)**

b. A four speed gearbox is to be designed for providing the ratios of 1.0, 1.46, 2.28 and 3.93. The diametrical pitch of each gear is 3.25 mm, the smallest pinion is to have at least 15 teeth. Determine the suitable number of teeth of different gears and the distance between the main shaft and lay shaft. **(10 Marks)**

OR

6 a. Discuss the various resistances to the motion of a vehicle briefly. **(06 Marks)**

b. A truck has a gross vehicle weight of 89026 N. The power developed at governed speed of 2400 rpm is 77.3 KW. Maximum torque is 345.8 Nm at 1400 rpm. The rear axle ratio 6.166:1. The fourth speed reduction ratio in transmission 1.605:1. The drive line losses amount to 10.7 KW at 2400 rpm and 6.3 KW at 1400 rpm. Tyre size has an effective wheel dia of 0.95 m. Frontal area 6.95 m^2. Calculate the grade which the vehicle can climb in still air conditions at

(i) Engine governed speed

(ii) At the speed of maximum torque.

The coefficients of rolling resistances and air resistances are 0.014 and 0.0462 respectively. **(10 Marks)**

Module-4

7 a. With a neat diagram explain the working of Wilson planetary transmission system. **(12 Marks)**

b. With neat sketch explain the working of free wheel unit. **(04 Marks)**

OR

8 a. Explain vacuum control in planetary gearbox using a neat sketch. (08 Marks)

b. Discuss the advantages and disadvantages of epicyclic gear trains. (08 Marks)

Module-5

9 a. What is automatic transmission? Discuss the advantages and disadvantages of automatic transmission. (10 Marks)

b. List out different hydrostatic drives. Explain the basic working principle of any one. (06 Marks)

OR

10 a. With sketch, explain the working of Borg-Warner automatic transmission. (10 Marks)

b. Briefly explain the various components of hydrostatic transmission system. (06 Marks)

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